



Forest  
Service

February 2015



# Rangeland Specialist Report

## Lake Mountain and Middle Tompkins Grazing Allotment Management Plan Project

Oak Knoll and Scott River Ranger Districts, Klamath National Forest,  
Siskiyou County, CA

*T44N, R11W, Sections 3-10, 16-18; T44N, R12W Sections 1, 12, 13; T45N, R11W,  
Sections 2-5, 8-11, 14-18, 19-23, 26-34; T45N, R12W, Section 25, 36; T46N, R11W  
Sections 17, 20, 21, 26-29, 32-36, Mt. Diablo Meridian*





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## Executive Summary

### Methodology

This report describes the grazing situation on the allotments and discloses effects to rangelands anticipated as a result of the Lake Mountain and Middle Tompkins Allotment Management Project. To determine the effects on rangeland resources from the reauthorization of grazing on the Lake Mountain and Middle Tompkins allotments, the ecological condition and trend data of vegetation in capable and suitable rangelands is examined to determine if the alternatives will meet or move toward Desired Conditions. Alternative 1 is the No Action/No Grazing, Alternative 2 is the Proposed Action and Alternative 3 is the Current Management situation.

The following categories were used as indicators to understand rangeland site conditions when comparing the proposed action to the alternatives:

- Expected Use Levels
  - This indicator uses past monitoring results and professional judgment by resource specialists to determine the percent of the allotment in each use level as defined in Table 12.
- Range Improvement Needs
  - This indicator outlines the range improvements needed to meet the desired condition and to implement the AMS.
- Number of Head Months
  - This indicator illustrates the potential use for each allotment to meet the purpose and need.
- Ecological condition and trend for grazed riparian areas and rangelands
  - This indicator compares the expected effects from grazing on the allotments to the results from condition and trend monitoring protocols.

The analysis area for rangeland resources is approximately 26,000 acres of National Forest System (NFS) lands in the Middle Tompkins and Lake Mountain range allotments. For cumulative effects analysis the entire project area was used. Short term effects are captured by the expected use level indicator. They generally describe annual effects. Long term effects (>5 years) are described by the ecological condition and trend indicator.

### Affected Environment

Approximately 24% of the allotment is capable of supporting grazing activities. Plots installed in 2012 and 2013 using the Rooted Frequency monitoring method showed a moderate to high vegetation condition and a satisfactory ecological condition. In the analysis area, the Happy Camp Complex Fire did not produce serious deep-rooted mortality of meadow vegetation to the point of negatively altering existing communities or their ability to recover quickly.

## **Environmental Consequences**

### ***Alternative 1-No Action (no grazing)***

#### **Direct Effects and Indirect Effects**

Alternative 1 would not meet the purpose and need of providing sustainable livestock grazing opportunities on either allotment. There would be no forage use other than what occurs from native ungulates. Range improvements would not be constructed and existing structures would not be maintained. Overall, ecological condition will likely continue to be satisfactory and trend would be stable or increase on grazed riparian areas and rangelands depending on climate and soil type. However, implementation of Alternative 1 will not allow Tyler Meadow to move toward potential natural community. If grazing is not resumed on Middle Tompkins Allotment, opportunities will be lost to use livestock as a management tool (Svejcar et al. 2014) to move Tyler Meadow toward potential natural community.

#### **Cumulative Effects**

The Frying Pan-Faulkstein Fire of 2014 and subsequently planned Westside Fire Recovery project in both allotments will release transitory rangeland and potentially increase the size of some meadows; however the extra forage would only be available for native ungulates as this alternative does not permit livestock grazing. Ecological condition and trend of rangelands will likely continue to be satisfactory with the ability to remain stable or increase depending on soil type and climate. Meadows and springs will be protected from compaction and ground disturbing activities through Westside Fire Recovery project design features. Heavy equipment use on the Westside Fire Recovery project has the potential to spread weeds and affect rangeland condition; however project design features will be in place to adequately mitigate risks.

### ***Alternative 2 –Proposed Action***

#### **Direct Effects and Indirect Effects**

Alternative 2 will meet the purpose and need of providing sustainable livestock grazing opportunities on the proposed analysis allotments and will facilitate meeting KNF standards and guidelines for condition and trend of rangeland resources. 76 HMs would be permitted on the Lake Mountain Allotment and 250 HMs would be permitted on the Middle Tompkins Allotment. Under Alternative 2 a stable or slow upward trend is expected to continue as Adaptive Management actions will be implemented if standards are not being met. Alternative 2 would allow grazing to be used as a tool to move Tyler Meadow toward potential natural community. High use levels on NFS lands is expected to occur on 0.2% or less of the analysis area and moderate use is expected to occur on approximately 1% of the of the analysis area. Grazing management tools are also listed within the Adaptive Management Strategy to help distribute cattle and decrease concentration on the landscape.

Under Alternative 2, development of Lookout Spring will protect the vegetation around the spring from trampling and allow perennial sedges to rest and expand. Installation of the stock-watering trough near the forest edge will increase soil compaction on upland areas at the site and

around the fence, but is expected to reduce trampling at the hillside-seeps below the wet meadow basin. The headcut enclosure at Faulkstein meadows will protect the instable soils from possible livestock impact (trampling, slumping) so the headcut can move or heal naturally.

### Cumulative Effects

The Frying Pan-Faulkstein Fire of 2014 and subsequently planned Westside Fire Recovery project in both allotments will release transitory rangeland and potentially increase the size of some meadows; expected use levels may decline at key areas as cattle will be distributed throughout the new transitory range. Ecological condition and trend of rangelands will likely continue to be satisfactory with the ability to remain stable or increase depending on soil type and climate. Risk of weed invasion will be mitigated through project design features although there will be a greater risk of spread with heavy equipment, firewood cutters, recreationist, and cattle moving through the allotment area. Number of HMs permitted would be unaffected as transitory range is temporary in nature and will not increase forage over the long term.

### Alternative 3 –Current Management

#### Direct Effects and Indirect Effects

Alternative 3 would partially meet the purpose and need of providing sustainable livestock grazing opportunities in the project area. Permitted HMs on the Lake Mountain Allotment would be 76; there would be no HMs permitted on the Middle Tompkins Allotment. Long-term rangeland monitoring demonstrates that key areas are meeting or moving toward desired conditions in the analysis area under current management. High use would occur mostly in the Kuntz Creek basin. There would be no use in Middle Tompkins. There would be no new range improvements built. With no enclosure, concentrated use will continue at Lookout spring; the small sedge community is at risk of converting to a low seral grass.

### Cumulative Effects

The cumulative effects identified for alternative 2 would apply to the Lake Mountain Allotment. The cumulative effects identified for alternative 1 would apply to the Middle Tompkins Allotment.

### Summary of Effects

To provide for ease of comparison, direct, indirect, and cumulative effects of Alternatives 1, 2, & 3 are summarized below in Table ES-1.

**Table ES-1 - Summary of alternative actions.**

Indicator	Alternative 1	Alternative 2	Alternative 3
Head Months (HM) <sup>1</sup>	0	326 (250 + 76)	76
Ecological condition	Satisfactory condition	Satisfactory condition	Satisfactory condition
Trend	stable/up	stable/up, with a potential upward trend in Tyler Meadow	Stable/up, with a potential downward trend at Lookout Spring.

Use Levels	None	Some areas of high and moderate use. Distribution tools available through Adaptive Management Strategy	Some areas of high and moderate use. Use is concentrated in Kuntz Creek Basin. No use in Middle Tompkins
Range Improvements Needed	None	Lookout Spring development and Faulkstein exclosure	No additional improvements
<sup>1</sup> HMs are the number of permitted livestock multiplied by the number of months (30 days) they are out on the grazing allotment. (e.g., 100 cow/calf pairs x 3 months = 300 HMs)			

### ***Compliance with law, regulation, policy, and the Forest Plan***

The Klamath National Forest operates under guidance of the Land and Resource Management Plan, KNF LRMP. The LRMP incorporates the Record of Decision for the Northwest Forest Plan (ROD). The LRMP and ROD established land allocations based on management emphasis with specific goals, desired future conditions, and standards and guidelines(S&Gs). The LRMP also provides Forest-wide goals, desired future conditions, and S&Gs. Current management under Alternative 3 has been determined consistent with the LRMP and, based upon monitoring, meets resource objectives. Forest Plan Standards and Guidelines as well as law, regulation, and policy that apply to the range resource will be met for each alternative by maintaining or enhancing ecological condition. All Alternatives meet or partially meet desired conditions for rangelands. Impacts from grazing are reduced to the extent possible with project design features.

## Rangeland Resource Report

### Introduction

The project area encompasses approximately 24,868 acres and straddles the Oak Knoll and Scott River District boundary of the Klamath National Forest west of Scott Bar, California in Siskiyou County. The legal locations are T44N, R11W, Sections 3-10, 16-18; T44N, R12W Sections 1,12,13; T45N, R11W, Sections 2-5, 8-11, 14-18, 19-23, 26-34; T45N, R12W, Section 25, 36; T46N, R11W Sections 17, 20, 21, 26-29, 32-36, Mt. Diablo Meridian. Private land accounts for about 478 acres within the project boundary, leaving about 24,390 acres that may be authorized for grazing on National Forest System lands.

This report describes the grazing situation on the allotments and discloses effects to rangelands anticipated as a result of the Lake Mountain and Middle Tompkins Allotment Management Project (Project). For a complete description of the project purpose and need and alternatives analyzed, please refer to the *Lake Mountain and Middle Tompkins Allotment Management Plan Project Environmental Assessment* (EA) for this project. A complete list of project design features applicable to all resources is included in the alternative description within the EA.

### Methodology

The method used to determine effects on rangeland resources was a qualitative comparison of each Alternative's likelihood of meeting the Land and Resource Management Plan (LRMP) desired condition to the existing conditions. Existing conditions were determined through field visits, monitoring data, historical records for each allotment, and scoping.

To describe the rangeland resources in the project area and analyze alternatives, the following KNF GIS<sup>1</sup> data files were used:

- Allotment and unit/pasture boundaries
- Land ownership
- Key areas
- High/Moderate/Low use areas
- Monitoring site locations
- Hydrologic units
- Fire Severity
- Structural improvements – stockwater, corrals, etc.

Two types of monitoring have been employed on the allotments; effectiveness monitoring and implementation monitoring. Effectiveness monitoring is long-term monitoring completed to determine whether Forest Plan standards and guidelines for grazing are sustaining or moving rangeland toward desired conditions, and to establish baseline information for future planning.

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<sup>1</sup>

<sup>1</sup> Some GIS acreages have been rounded to ease calculations.

Implementation monitoring is short-term monitoring performed to conclude whether Forest Plan standards and guidelines for grazing are being met.

These methods have been employed in upland, meadow, and riparian areas key areas. The Society for Range Management (1998) defines key area as “A relatively small portion of a range selected because of its location, use, or grazing value as a monitoring point for grazing.” Key areas should be located within a single ecological site or plant community, be responsive to management actions and be indicative of the ecological site or plant community they are intended to represent (USDI. 1999). In the project area, key areas have been selected for their location, grazing value, or use; and they serve as indicative samples of rangeland condition, trend, or degree of seasonal use. Monitoring records are on file in the Salmon/Scott River Ranger District. Key areas within the allotments have been monitored to determine rangeland health, range readiness and utilization for over 55 years. Using various methods, data has been collected and recorded on Lake Mountain or Middle Tompkins as early as 1957 and as recently as 2013. Long-term monitoring techniques employed include Best Management Practices Effectiveness Program (BMPEP), National Marine Fisheries Biological Opinion Monitoring, Photo Point Monitoring, Parker 3-step, toe-point, and rooted frequency. Proper Functioning Condition assessments were completed during 2013 and 2014.

Detailed descriptions of monitoring method are included in the monitoring section of Affected Environment below.

#### ***Analysis Indicators***

The following categories were used as indicators to understand rangeland site conditions when comparing the proposed action to the alternatives:

- Expected Use Levels
  - This indicator uses past monitoring results and professional judgment by resource specialists to determine the percent of the allotment in each use level as defined in Table 12.
- Range Improvement Needs
  - This indicator outlines the range improvements needed to meet the desired condition and to implement the AMS.
- Number of Head Months
  - This indicator illustrates the potential use for each allotment to meet the purpose and need.
- Ecological condition and trend for grazed riparian areas and rangelands
  - This indicator compares the expected effects from grazing on the allotments to the results from condition and trend monitoring protocols.

#### ***Spatial and Temporal Boundaries for Effects Analysis***

The analysis area for rangeland resources is approximately 26,000 acres of National Forest System (NFS) lands in the Middle Tompkins and Lake Mountain range allotments. For cumulative effects analysis the entire project area was used. Short term effects are captured by the expected use level indicator. They generally describe

annual effects. Long term effects (>5 years) are described by the ecological condition and trend indicator.

## Affected Environment

### Description of Project Area

The Lake Mountain and Middle Tompkins grazing allotments are located within the Klamath Ranges. Topography is steep; some slopes are estimated to exceed 50%, especially at the upper limits of watersheds, and at lower elevations where drainages enter Scott River. Gentler slopes are mostly restricted to ridgetops, spur-ridges, and concave landscapes formed around stream headwaters. The general analysis area lies within the Tom Martin Creek-Klamath River, O'Neil Creek, Schutts Gulch-Klamath River, Tompkins Creek, Middle Creek, Upper Grider Creek, Rancheria Creek, Deep Creek-Scott River, and McCarthy Creek-Scott River watersheds. Elevations range from approximately 1500 feet near the Klamath River to 7000 feet at Lake Mountain and Tom Martin Peaks.

Table 1-Allotment acres by ownership and boundary.

Allotment Name	Total Acres	NFS Acres	Total Acres Proposed boundary:	NFS Acres: Proposed boundary
Lake Mountain	10,039	9590	5,342	5330
Middle Tompkins	14,829	14,800	16,863	16,790
<b>TOTAL</b>	<b>24,868</b>	<b>24,390</b>	<b>22,205</b>	<b>22,120</b>

### Plant Communities

The dominant vegetation types vary depending on elevation. The highest elevation forests are made up of mixed subalpine forest including Shasta fir and mountain hemlock. Mid and low elevation forest are mainly mixed conifer including Douglas fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*), with lowest elevations being dominated by canyon live oak (*Quercus chrysolepis*) and pacific madrone (*Arbutus menziesii*). On steeper slopes in both allotments narrow V-shaped drainages limit riparian vegetation zone development. First- and second-order drainages are often intermittent, contributing to poor riparian zone vegetation development. At higher elevations mountain alder (*Alnus incana tenuifolia*) is more common than willow species where gradient becomes gentle enough to encourage riparian zone development in streamside areas.

Seral status, also called seral stage, is a stage of secondary successional development. USFS recognizes four seral stages. These include 1) the Potential Natural Community (PNC) under the existing environment. Seral species are scarce to absent, 2) Late seral: PNC species are dominant, but seral species still persist; 3) Mid seral: PNC species are increasing and colonizing the site; they are approaching equal proportions with seral species, and 4) Early seral: clear dominance of seral species; PNC species are absent or in very low numbers (Hall et al. 1995).

The assessment area has been divided into vegetation types to facilitate understanding of rangeland conditions. A summary of vegetation types by allotment is displayed in Table 2.

**Table 2 - Vegetation types within the analysis area by acreage.**

Cover Type*	Analysis Area**	Proposed Analysis Area***
Barren Land	103	19
Ceanothus Mixed Chaparral	89	29
Forest Land	23,302	21,170
Montane Meadow	116	130
Montane Shrubland	564	642
Scrub-Oak Mixed Chaparral	14	7
Snowbrush	2	2
Valley Grassland	130	121
Urban	4	0
Non-Forest/Other	66	0
*Cover Type acres are derived from the GIS layer of the Society for Range Management Cover Types, described in Shiflet, 1994.		
**The analysis area includes the current Lake Mountain and Middle Tompkins boundaries.		
***The proposed analysis area includes the proposed boundaries for the Lake Mountain and Middle Tompkins allotments.		

“Barren Land” is patches or rock outcrop or other areas barren of vegetation and not grazed because of lack of forage.

“Ceanothus Mixed Chaparral” is dominated by ceanothus species with other shrubs: livestock forage is limited except in areas burned or occupied by associated sub-shrubs and annual grasses.

“Forest Land” comprised of full-canopy conifer forests is most extensive on all allotments; these forests are generally Ponderosa Pine at lower elevations and true fir at upper elevations. Although conifer overstory limits forage development some forage is produced and utilized by livestock in forest openings or in places where thinning, fuels treatment, or fire create transitory range. Transitory range may provide moderate to high amounts of forage; but is “transitory” because conifer succession should eventually provide trees large and dense enough to limit understory herbaceous production. Forest lands on the fringe of herbaceous areas provide livestock with cover and resting areas.

“Montane Meadows” support grasses and grasslike plants in flatter areas with deep, seasonally saturated heavy soils which contain streams or springs. These are generally considered of greatest importance to rangeland use, both for forage production and regarding potential impacts to other resources. Willow and alder communities may associate along streamcourses.

“Montane Shrubland” is often dominated by a mix of ceanothus species, manzanita species, bitter cherry, and scrub oaks in sloped areas. Disturbed stands have potential to provide livestock with forage, but mid seral stands are often too dense to support herbaceous species, and late seral stands provide for conifer succession.

“Scrub-Oak Mixed Chaparral” includes a dominant overstory of oak species with ceanothus species a primary associate. Understory grasses and palatable shrubs are often available for livestock forage.

“Snowbrush” is dominated by *Ceanothus velutinus*. Snowbrush forms dense inaccessible brushfields that suppress understory shrubs and forbs. This type is not important for domestic or wild ungulates, but is a good habitat for birds and small mammals.

“Valley Grassland” at lower elevations is characterized by annual grasses and forbs. It can provide livestock forage early, but is mostly dry and unpalatable when cattle are traditionally released onto the Lake Mountain and Middle Tompkins allotments.

The inventory of Cover Types was completed prior to the Happy Camp Complex Fire of 2014 (Table 2). The acreages presented in Table 2 represent pre-existing cover conditions, and may not be accurate now or in the future. Cover types are governed by site potential and are a reflection of site conditions including elevation, climate, soil development, geologic parent material, slope, and exposure (aspect) as these factors determine total solar radiation striking the ground surface. (Dyksterhuis. 1949; USDI-USDA. 2013.) These factors are interdependent and interact in complex relationships which shift over time.

Disturbance, including fire, can also play a role in regulating existing cover type. Depending upon burn intensity, fire may produce minor or major changes to amount of solar radiation, total cover at various canopy levels, and even soil development if erosion accelerates when cover is burned off. These changes can influence site potential at any location, and may or may not alter or influence successional pathways leading to the development of mature cover types at those locations. (Westoby. 1980; Stringham et al. 2001 and 2003.)

In light of this, we should regard the acreages presented in Table 2 as representing a snapshot in time: that is, the time prior to the effects of the Happy Camp Complex Fire. The precise post-recovery arrangements of these cover types across the affected landscape are unknown, but it is reasonable to expect a mosaic of these vegetative cover types will remain. It is unrealistic to alter the Cover Type acreages and percentages in Table 2 at this time due to uncertainties regarding which successional pathways will open up or be closed down for any given Cover Type within the project area.

### ***Suitability and Capability***

Suitability and Capability of rangeland for livestock grazing is determined at the Forest Plan level and verified at the site specific level. The allotments in the project area were determined to be suitable and capable for livestock grazing during the planning and analysis for the KNF Forest Plan in 1995. (Forest Plan Clarification Memorandum, 2015.)

**Commented [UFS1]:** This will need to be added to references once it gets signed.

Suitability is defined in 36 CFR 219.3 as:

“The appropriateness of applying certain resource management practices to a particular area of land as determined by an analysis of the economic and environmental consequences and alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.”

Suitability for grazing was reviewed by the Interdisciplinary Team for this project. Examples of non-suitable lands can include administrative sites or other management areas (MAs) that exclude grazing. Table 6 summarizes the MA acres by allotment. Grazing is compatible, and therefore suitable, within all of the MAs in the allotments.

**Table 3 - Management Area acreages by allotment.**

Management Area	Lake Mountain	Lake Mountain Proposed Boundary	Middle Tompkins	Middle Tompkins Proposed Boundary
Special Habitat (LSR)	4,527	2,472	10,970	13,481
Special Interest Areas	3	3	1	1

Management Area	Lake Mountain	Lake Mountain Proposed Boundary	Middle Tompkins	Middle Tompkins Proposed Boundary
Riparian Reserves	2,499	1,221	3,893	4,350
Retention Visual Quality Objective	1,155	97	52	280
Partial Retention Visual Quality Objective	7,770	4,554	13,482	15,395
General Forest	785	728	922	910

Capability is defined in 36 CFR 219.3 as:

“The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current resource conditions and site conditions such as climate, slope, landform, soils, geology, as well as application of management practices, such as silviculture or protection from fire, insects, and disease.”

In relation to grazing, capability is defined as lands accessible to livestock, producing forage or having inherent forage-producing capability, and able to withstand grazing on a sustained basis under reasonable management practices. Accessible areas that produce forage as a result of timber management practices, fire, or other events may be classified as capable rangeland.

Rangeland capability was reviewed on NFS lands within the analysis area. Capability was analyzed using the KNF GIS database and verified through field visits and professional knowledge of the forage in the allotment. Lands not considered capable included those areas that do not produce forage (such as roads, water bodies, and streams), are barren, are more than two miles from accessible water, or areas where slopes exceed 40% gradient. The resulting acreage figures are approximations. When suitable and capable rangelands are overlaid, they cover about 20-25% of NFS lands in the analysis area.

**Table 4 - Acres of Capable and Suitable rangelands on NFS lands in the analysis allotments.**

Allotment	NFS Acres	Suitable Acres	Capable Acres	Percent of Allotment Suitable/Capable
Lake Mountain	9590	9590	2340	24%
Middle Tompkins	14,800	14,800	2920	20%
<b>ANALYSIS AREA TOTAL</b>	<b>24,390</b>	<b>24,390</b>	<b>5260</b>	<b>22%</b>
Lake Mountain Proposed Boundary	5330	5330	1490	28%
Middle Tompkins Proposed Boundary	16,790	16,790	3830	23%
<b>PROPOSED BOUNDARY AREA TOTAL</b>	<b>22,120</b>	<b>22,120</b>	<b>5320</b>	<b>24%</b>

Acres not deemed capable may receive incidental use. For example, a forested area or road that was not identified as capable may be used for bedding areas or travel between forage areas. Livestock need not to be prohibited from those areas because the suitability analysis for this project determined that livestock grazing did not need to be excluded from any of the management areas.

### **Desired Conditions**

The following are Klamath National Forest Land and Resource Management Plan Desired Conditions for rangelands:

- Composition and structure of forest, rangeland and aquatic ecosystems is within natural range of variability. These ecosystems are healthy and resilient to change (Page 4-14).
- Healthy and resilient rangeland ecosystems provide sustainable forage for use by livestock and wildlife (Page 4-16).

Table 5 outlines desired conditions for wet meadows, uplands, and riparian communities within the capable and suitable acres. The corresponding monitoring protocol used and name of the plot that describes the existing condition is listed and is explained in more detail in the Existing Condition/Rangeland Monitoring section.

**Table 5 - Desired conditions for analysis area.**

<b>Vegetation Community Type</b>	<b>Desired Conditions</b>	<b>Existing Condition Monitoring Protocol/Plot</b>
Wet Meadow	1) Desired condition: i) Maintain water table at or near meadow surface (within 2 feet) ii) Maintain or increase plant species diversity (mix of desirable sedges, grasses, and forbs) iii) Maintain or restore stream channel and stream sinuosity (overhanging banks, vegetated point bars, stable banks) iv) Maintain and increase ground cover to protect soil (basal vegetation, lichen, rock, cryptogam, wood) to 90%	Rooted Frequency/Middle Creek Meadows Rooted Frequency/Tyler Meadow
Upland	2) Desired condition: i) Maintain or promote a mosaic of cover and forage habitat (shrubs, trees, browser, and herbaceous plants) ii) Maintain or increase the variety of browse age and size classes (60% young, 40% older; 50% less than 3 feet tall, 50% over 3 feet tall) iii) Maintain or promote a mixture of grasses and forbs providing summer and spring game forage (species composition or perennial plants includes 55% forbs and 45% grasses)	Rooted Frequency/Kuntz Creek
Riparian	3) Desired condition: i) Maintain or increase a desirable plant species composition such as predominance of perennial species whose roots are deep and rhizomatous with the ability to hold soil in place (e.g., > 80% species with desirable characteristics) ii) Maintain or increase riparian shrub vigor, diversity, and bank cover on sites with a woody component	NMFS Monitoring/Tompkins Creek PFC/Kuntz Creek PFC/Townsend Meadow Creek PFC/Tyler Meadow-Fish Creek Headwaters PFC/Faulkstein Meadow

### **Historic and Current Management of Grazing Allotments**

Grazing by domestic livestock has occurred in the project area for over 100 years. During the mid- to late-1800s, in early spring, Scott Valley and Klamath River settlers grazed animals including cattle, horses, sheep, goats, and pigs from low elevations up into the high country as

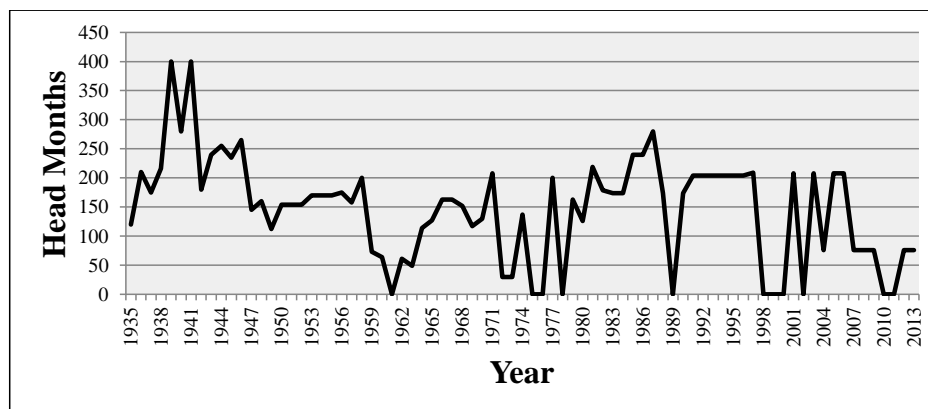
the snow receded and returned to valley ranches with mountain snows. Livestock numbers were considerably higher than those currently permitted, and the grazing season included additional months. Highest permitted numbers and longest seasons of use occurred from time of settlement until around 1912. During the 1930s livestock numbers and season length were reduced until about 1960, with the exception of a period of time around World War II.

**Table 6 - Pasture Units within the analysis allotment.**

Allotment Name	Pasture Unit Names
Lake Mountain	Lake Mountain Unit
Middle Tompkins	Eagle Springs Unit, Middle Creek Unit, Tyler Unit

### Lake Mountain Allotment History

The Lake Mountain Allotment grazing permit has been issued solely for cattle, and has generally been used by small scale ranch operations. Current allotment boundaries have been in place since the 1920's. Prior to that date, the KNF issued annual permits but the documentation is sparse. The allotment formerly included a spring range which followed Schutts Gulch north to Johnny O'Neil Ridge and then east and south until it intersected Negro Creek down to the Klamath River. The spring range was abandoned after 1973. The most intensive grazing occurred around 1940 when there was a high of over 400 Head Months (HM) permitted. This number has declined as waived permits were not filled and lack of timber harvest reduced available transitory range. The spring portion was grazed from 4/1 to 7/1 and the summer range was grazed from 7/1 to 10/15. Historically, cattle were turned onto the spring range north of the Klamath River, and then herded across Highway 96 up O'Neil Creek road for 0.5 miles; a gate was then closed behind them to prevent them from returning to the highway.



**Figure 1 - History of use for the Lake Mountain Allotment over the past 75 years.**

### Middle Tompkins Allotment History

The Middle Tompkins Allotment was established in 1979 but portions of Middle Tompkins Allotment as currently defined have been permitted for grazing since the establishment of the Forest Service. From the late 1920's through 1946, the Tyler Meadow Allotment (Middle Creek, Rancheria Creek, Yellowjacket Springs, Faulkstein Camp, Stud Horse, and Tyler Meadows areas) was grazed by 130 head under temporary permits from 7/15 through 10/31.

To alleviate grazing pressure on the Big Ridge Allotment, the Tyler Meadow Allotment was managed as part of Big Ridge from 1946 through 1973. Forty pair used Tyler Meadow and the Faulkstein Camp area from 7/16 to 9/15, and 35 pair were allotted to Rancheria Creek, Yellowjacket Springs, and the southwest side of Lake Mountain ridge from 7/16 to 9/15. From 9/16 to 10/15, all the cattle were herded to the upper reaches of Middle Creek, Stud Horse, and Deep Creek.

The Tyler Meadow Allotment was taken out of the Big Ridge Allotment Management Plan in 1973 because of increased logging and installation of road systems. From 1965 through 1980 about 700 acres of the Tompkins Creek watershed were logged, opening up transitory range. During 1979, new Middle Tompkins boundaries were drawn, focusing grazing within Tompkins Creek and Middle Creek Drainages, but also included Faulkstein Camp and Tyler Meadow areas. To promote conifer growth 100 cattle pairs were herded into conifer plantations to graze herbaceous understory. As these plantations matured, grazing capacity of Middle Tompkins gradually decreased. Some selective harvesting and fuels treatments continue to open up transitory range.

During 1987, the Grider Fire required bulldozer construction of a fire line that bisected Tyler Meadow. The dozer line was rehabilitated with creeping bentgrass (*Agrostis stolonifera*) and this exotic species, now naturalized, currently dominates Tyler Meadow. Prior to bentgrass introduction, Nebraska sedge (*Carex nebrascensis*) probably dominated the meadow swale. Nebraska sedge is a palatable, native, late seral species with roots excellent for stabilizing soil (Hall et al. 1995).

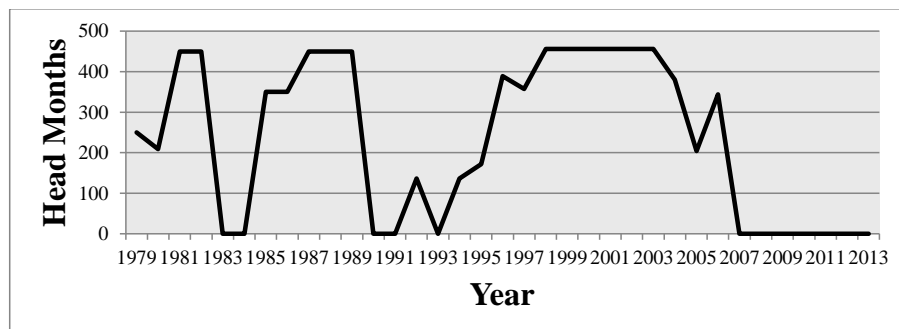


Figure 2 - History of use for the Middle Tompkins Allotment over the past 35 years.

## **Lake Mountain Current Livestock Management**

Permittee: Curtis Peters/Derek Suetta

Permitted use: 25 cow/calf, 7/15 thru 10/15

The current permittee has grazed the allotment since 1979. Small groups of cattle are hauled to the ridge between East Walker Creek and O'Neil Creek in section 5 and distributed into near-by forage pockets when rangelands are ready, usually around July 15th. Cattle slowly move into higher elevations by traveling on roads into the forage areas surrounding Kuntz Creek, Mill Creek, and Mack's Creek. Livestock graze these areas season-long until removal commences, usually during the first part of October. Salting and herding are used to distribute livestock through the allotment although cattle tend to congregate near the Kuntz Creek area. Livestock are drawn to the southern half of the allotment because forage and water are easily accessed. Access to the northern part of the allotment is severely limited by a lack of roads and capable areas near the Klamath River are mostly inaccessible due to the steep terrain and lack of available forage and water in between the low and high elevation ranges.

## **Middle Tompkins Current Livestock Management**

Permittee: no current permittee

Former Permitted Use: 90 cow/calf pairs, 5/16 thru 10/15

The last permittee grazed the allotment from 1996 through 2006; then took nonuse until the permit was waived back to the government in 2010. Cattle were brought into the lower elevations of the allotment and grazed the lower Tompkins Creek area and Eagle Springs Unit first, then drifted or were herded into the upper elevations of the Tyler and Middle Creek Unit. Several issues arose concerning herd management, including Middle Tompkins permitted cattle drifting into Lake Mountain Allotment from the Eagle Springs unit, and also overutilizing Tyler and Middle Creek Meadows.

Abundance of roadside and forest understory grass on the north and south side of Lake Mountain Ridge explained habitual drift of Middle Tompkins permitted cattle into Lake Mountain. In Middle Tompkins forage and water dry up on the south side of the ridge. North of the ridge (Lake Mountain Allotment) herbaceous understory is better developed and roadside forage more abundant. FS road 45N05Y offered easy access to the Lake Mountain Allotment. In the past, a drift fence was placed along 45N05Y in T45N, R11W, Section 26, NW ¼, NW ¼ and was effective for a number of years until cattle learned to go around it. To limit drift the permittee placed cattle in this unit first and reduced the amount of time cattle spent in the Eagle Springs unit. Nonuse was also taken to stop drift.

Middle Creek Meadows' location formerly produced a situation where without aggressive herding the area received heavy use at both the beginning and end of the grazing season. Utilization levels failed to meet basic standards (of 60% or less utilization) at Middle Creek due to inadequate livestock distribution throughout Middle Tompkins Allotment and a dwindling availability of transitory range. Various strategies were employed to mitigate overutilization as specified in AOIs, including establishment of a fenced exclosure which was effective when the fence was maintained and various grazing rotations were used in an attempt to achieve even livestock distribution allotment-wide. Tyler Meadow received use too early in the year which resulted in livestock staying in the area too long. The permittee changed grazing rotations in

order to try to mitigate this situation. These strategies were not consistently successful in meeting standards and guidelines for Middle Creek Meadows and Tyler Meadow so permit action was initiated in 2003 and the permittee ultimately reduced HMs on the allotment.

Under the current proposal, an Allotment Management Strategy (AMS) for grazing management is proposed to promote even distribution of livestock throughout the allotment and offer more options for the new permittee to be a successful manager. Permitted Head Months will also be significantly lower.

During 1995 allotment boundaries were digitized and the western Middle Tompkins boundary was confined to the Scott River District, (excluding the Faulkstein and Tyler Meadow areas) presumably through a GIS error. An EA completed for Middle Tompkins in 1996 used this GIS boundary. Hand drawn maps included in the 1996 Annual Operating Instructions (AOIs) for Middle Tompkins encompassed all areas of the allotment as previously grazed (which is the project's proposed boundary). Maps and a written description of the boundaries also included the Faulkstein and Tyler Meadow areas in a permit issued in 1997. AOI's dated after the EA was completed continued to list Tyler Meadow as a grazing unit of the allotment. Faulkstein and Tyler Meadow were traditionally part of Middle Tompkins, and they continued to be monitored. Though the boundary defined during 1995/1996 omitted Faulkstein and Tyler Meadow, no structures were erected and topographic features could not bar cattle from crossing over the gentle ridgecrest to graze. Including and managing these range resources will not encourage permitted livestock to drift further west into the Grider Creek area. Like the north part of Lake Mountain, steep slopes descending west from the Tyler Meadow and Rancheria Creek areas limit drift.

### **Wildfire**

During 2014 the Happy Camp Complex Fire burned through both the Lake Mountain and Middle Tompkins allotments. Levels of burn intensity by acre for each allotment are presented in Table 7 (see also Appendix A).

**Table 7 – Happy Camp Complex fire severity effects on analysis area vegetation.**

<b>Percent Mortality</b>	<b>Lake Mountain Allotment acres</b>	<b>Middle Tompkins Allotment acres</b>
1-10% mortality	1329	3222
10-25% mortality	722	1480
25-50% mortality	836	1353
50-75% mortality	683	796
75-90% mortality	454	421
90-100% mortality	2729	1769
unburned	2837	5759

TOTAL ACRES	9590	14800
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During October 2014 ocular reconnaissance conducted by KNF range staff revealed that burning had been patchy and irregular throughout both allotments. The most intense burning occurred where dense closed canopy forest dominated. In the Lake Mountain Allotment most of the high severity burning was in the non-capable north east portion of the allotment. In the Middle Tompkins Allotment high severity burning was scattered but a sizable spot burned just south of Tyler Meadow. In more open forest, burning was largely restricted to shrubs, duff, and small trees; plantations were particularly hard hit. At the time of inspection roadside forage in both allotments appeared largely unaffected. Herbaceous forest understory in both allotments was burned in patchy manner, but because this forage component is widely scattered and separated, effects could not be comprehensively assessed at time of inspection. Direct effects of the burn on meadows were minimal. Most meadows were either unburned, or lightly burned in spots. In the analysis area, the Happy Camp Complex Fire did not produce serious deep-rooted mortality of meadow vegetation to the point of negatively altering existing communities or of disrupting their dynamics or ability to recover quickly. How the fire will influence development of transitory range on the allotments will probably take several years to determine.

To allow for post-fire recovery of vegetation, livestock grazing areas will be modified within the project area where necessary. For the Middle Tompkins Allotment, livestock grazing permits will not be authorized until 2016 or later. Lake Mountain Allotment will be monitored prior to the 2015 grazing season to determine if vegetation has recovered enough to support grazing and grazing won't hinder tree establishment. If grazing is allowed, animals may be turned out at a later date and/or the season may be shortened in the fall to allow for optimal vegetation recovery and the most beneficial use of livestock grazing. These modifications for post-fire livestock use of rangelands will be variable based to rangeland conditions and climate as observed by rangeland managers.

### ***Existing Condition/Rangeland Monitoring***

#### ***Effectiveness Monitoring Parker 3-Step***

The Parker 3-step method was used from 1957 through 1984 for four transects on the Lake Mountain and Middle Tompkins allotments. The established method directed by Region 5 was the Parker Three Step Method up until 1997, at which time the Rooted Frequency method was then recommended because it was more easily replicated. These plots, generally read at 5 to 10 year intervals, show changes in plant species composition and soil conditions. As shown in Table 8, two historic plots were established on the Lake Mountain Allotment in the Kuntz Creek area, one in a dry meadow type and one in a moist meadow type. The Middle Tompkins Allotment contained a plot in an upland location at Tyler Meadow and another plot was located at Stud Horse Meadow in an upland location. Both of these plots were abandoned because they proved unsuitable for long term monitoring. Recent data collected with the Rooted Frequency protocol provides a better picture of present conditions.

**Table 8 - Parker 3-step monitoring results.**

Allotment	Unit/Plot	Last Year Read	Vegetation Type	Range Condition <sup>1</sup>	Apparent Trend <sup>2</sup>
Lake Mountain	Lake Mountain/Kuntz Creek 1	1997	Dry Meadow	Satisfactory	Static
Lake Mountain	Lake Mountain/Kuntz Creek 2	1997	Moist Meadow	Satisfactory	Upward
Middle Tompkins	Tyler/Tyler Meadow	1986	Dry Meadow	Unsatisfactory	Slight Upward
Middle Tompkins	Middle Creek/Stud Horse	1968	Dry Meadow	Unsatisfactory	Static
<sup>1</sup> From last condition rating. Satisfactory Ecological Condition is when soil is adequately protected and forage species composition and production meets Forest Plan objectives or the trend in forage species composition and production is acceptable.					
<sup>2</sup> Interpolated from seral rating from the R5 Range handbook (USDA-FS, 2008).					

### *Rooted Frequency*

Plant species composition is determined using rooted frequency in quadrat frames. In this method, each species rooted inside a metal quadrat frame placed at fixed intervals along a transect line is tallied. Rooted frequency was selected as the method to record plant composition because it is less biased than estimates of canopy cover and can be used on meadows that have been grazed. Mosley et al (1986) designed a plant frequency based rating system for mountain meadows in Idaho. Frequency is based on presence or absence of a species in a given number of repeatedly placed small quadrats. A species' frequency is the percentage of quadrats in which it occurs. Frequency sampling is advantageous for monitoring changes in species composition because it is simple to obtain, objective, and relatively stable from season-to-season and year-to-year on perennial meadow systems (Greig-Smith. 1983; Hyder et al. 1966; Mueller-Dombois and Ellenberg. 1974). To enable estimating ecological status, the Idaho system was modified to include soil attributes.

Three long term monitoring plots have been established in the analysis area using the rooted frequency method. The data summary is given in Table 9.

**Table 9 - Rooted Frequency Monitoring for Lake Mountain and Middle Tompkins allotments.**

Allotment	Plot Name	Years Read	Vegetation Type	Vegetation Condition <sup>1</sup>	Overall Condition <sup>2</sup>	Ecological Condition <sup>3</sup>
Lake Mountain	KLA1301-Kuntz Creek	2013	Dry Meadow	Moderate	Moderate	Satisfactory
Middle Tompkins	KLA1302-Tyler Meadow	2013	Moist Meadow	Moderate	High	Satisfactory
Middle Tompkins	KLA1201-Middle Creek Meadows	2012	Moist Meadow	Moderate	Moderate	Satisfactory
<sup>1</sup> Vegetation condition = range condition or successional stage. The terms high, moderate, and low to represent the vegetation condition. High = late seral, moderate = mid seral, and low = early seral.						
<sup>2</sup> Overall condition is based upon both hydrologic, vegetative, and soil resources.						
<sup>3</sup> Ecological condition simply summarizes overall condition as either satisfactory or non-satisfactory						

All plots are in satisfactory condition. High and moderate condition with a static or upward trend is satisfactory while low condition or anything with a downward trend is non-satisfactory. Trend is not displayed because the plots were recently installed and data is not available. Trend can be deduced for KLA1301 as it was established in the same location as the Parker 3-step plot Kuntz Creek 1. Since 1960, vegetation status has gone from low to moderate. Ground cover condition was low during 1960 due to a high percentage of bare ground; it has remained in low condition. Over the past 50 years a slight upward trend is evident for this plot. The Parker 3-step and frequency plot for Tyler Meadow are in the same meadow; but they are on different vegetation communities and cannot therefore be compared. Because Tyler and Middle Creek Meadows have not been grazed since 2006, current condition readings will make a good reference for comparing grazing effects if livestock grazing is permitted on the allotment.

In the absence of livestock grazing, introduced creeping bentgrass developed a dense litter layer that restricts access to fresh growth. This condition is neither new to Tyler Meadow, nor specific to creeping bentgrass. KNF documentation from 1964 indicates that after a period of several years without livestock grazing, *Carex* species that dominated the wetter portion of Tyler Meadow at that time had also formed a heavy mat of dead material that was restricting new growth.

Although the Middle Tompkins Allotment has not been grazed by livestock for eight years, Tyler Meadow has had regular use by elk throughout the vacancy. Elk return throughout the season to a patch of Nebraska Sedge to selectively graze. Very little use has been observed on creeping bentgrass. Bentgrass litter accumulated during vacancy has resisted decomposition and formed a barrier against sunlight reaching current growth. Bentgrass leaves have become long, slender, and less digestible, and less palatable. The heavy litter can also delay spring growth by insulating the soil, and it disrupts the mineral cycle (Wyman et al. 2006).

During 2014, the Frying Pan-Faulkstein Fire burned through the central swale of Tyler Meadow, consuming the heavy accumulation of horizontally lodged, dried bentgrass thatch. Reduction of bentgrass in the swale revealed that Nebraska sedge is still abundant across this part of the meadow, but was being suppressed by bentgrass thatch. Intensive grazing in the meadow could, if held to short duration periods with livestock herded out of the area when proper use is achieved, serve the same purpose as fire to release the underlying Nebraska sedge from bentgrass competition for sunlight and water.

#### *National Marine Fisheries Service Biological Opinion Monitoring*

During 1997, the National Marine Fisheries Service (NMFS) released two Biological Opinions (the 6/20/97 Biological and Conference Opinion for implementation of USDA Forest Service Land and Resource Management Plans for the Klamath, Mendocino, Shasta-Trinity, and Six Rivers National Forests; and the 8/28/97 Biological Opinion for permitted grazing on allotments on the Klamath National Forest) which listed the Middle Tompkins, among other allotments, with a May Affect Likely to Adversely Affect designation. During 1997 and 1998 a monitoring Strategy was developed jointly between NMFS and Forest Service resource specialists in the Northern Province to address reasonable and prudent measures and terms and conditions in the NMFS Biological Opinions (BO). This strategy and subsequent monitoring was initiated in 1998. Monitoring was conducted annually since 1998 on all MALAA allotments on the Forest covered by this (BO). A field review of two representative allotments was conducted by the Forest and NMFS during the Level 1 October 1999 review on the Klamath National Forest. The

team visited the Horse Creek and Seiad-Johnny grazing allotments covered under the KNF Grazing BO. The team agreed that adverse effects to listed anadromous fish were not likely occurring. In addition, monitoring during 1998-2000 indicated that potential livestock-related impacts to anadromous fish in these areas are negligible. During 2001, the Klamath National Forest planned to submit a proposal to re-initiate consultation on several grazing allotments, including Middle Tompkins; however, the proposal was never finalized.

Monitoring that has been conducted on the Middle Tompkins Allotment includes Photo Points, Best Management Practices (BMP) evaluations, and a Stream Channel Inventory. During 1998 a Stream Condition Inventory (SCI) plot was installed and read at a site along Tompkins Creek that is accessible by cattle at the beginning and end of the grazing season. The site was heavily impacted by flooding during the 1997 season. Because grazeable vegetation is minimal, cattle impact is minimal or absent at this SCI location. The SCI monitoring demonstrated the general character of the stream area and the impacts associated with natural disturbance of the flood; but grazing impacts were not present. SCI survey forms and the associated data are available at the Salmon/Scott Ranger District. The NMFS photo points and BMP monitoring are discussed below.

#### *Best Management Practices Effectiveness Program*

The BMPEP is long-term monitoring conducted on key areas chosen at random from a sample pool. The USFS Region 5 grazing protocol records herbaceous and woody utilization levels, streambank disturbance, ground cover, bank angle, riparian and upslope erosion, and riparian vegetation and seral condition information.

As part of the NMFS monitoring and the BMPEP, the Middle Tompkins Allotment has received four BMP G24 evaluations over the last fifteen years. The allotment had two evaluations done on Tompkins Creek in 1998 and 2000, and two evaluations done on Tyler Meadow in 1999 and 2008. All BMP categories met or exceeded standards and guidelines for implementation and the effectiveness rating demonstrated that grazing is not degrading water resources in the allotment.

Two BMP evaluations have been completed on the Lake Mountain Allotment at the Lookout Spring area; one in 2012, and a follow-up evaluation in 2013. Monitoring results from 2012 indicated that hoof prints affect more than 10% of this small spring area and may be impacting soil saturation; however the herbaceous vegetation appeared to be maintaining vigor and was mostly composed of mid to late seral species. Implementation standards and guidelines were met. Fencing the spring area and piping water into a trough outside the enclosure was recommended. For the 2013 BMP evaluation similar impacts were observed at Lookout Spring and it was noted that most impacts are annual with compaction at the spring site being the main long term impact. Beneficial uses of Kuntz Creek are not being affected, and the riparian and channel effectiveness criteria are being met, as well as key area effectiveness criteria. All implementation standards met or exceeded standards and guidelines other than utilization in the dry meadow. Utilization met 80% of the standard in the Kuntz Creek key area.

### *Photo Point Monitoring*

There is one riparian photopoint located on Tompkins Creek depicting upstream and downstream conditions. Beginning in 1998 through 2006, this photopoint has been monitored annually in spring and fall. No grazing use or streambank alteration by livestock is apparent, as along the anadromous reach there is minimal herbaceous forage to attract livestock. Access by livestock is limited except when entering and leaving the allotment at the beginning and end of the grazing season. Monitoring is also conducted at photopoints in all key areas in conjunction with utilization and effectiveness monitoring. Photo points taken with Parker 3-step and Rooted Frequency monitoring illustrate vegetation condition and trend qualitatively. One very noticeable change at the Kuntz Creek key area is that over the past 50 years tree canopy has become denser and conifers are encroaching on the meadows through forest succession in absence of fire and timber harvest. This has also been confirmed through aerial photos of the region.

### *Proper Functioning Condition*

Proper Functioning Condition (PFC) is a qualitative method for assessing the condition of riparian-wetland areas (USDI, 1998, 2003). The term PFC is used to describe the assessment process as well as defining an on-the-ground condition rating for riparian wetland areas. The PFC assessment refers to a consistent approach for considering hydrology, vegetation, and erosion/deposition (soils) attributes and processes to assess the condition of riparian wetland areas. The on-the-ground condition termed PFC refers to how well the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland area to hold together during high-flow events. This resiliency allows an area to then produce desired values such as fish habitat, Neotropical bird habitat, or forage over time. Riparian-wetland areas that are not functioning properly cannot sustain these values. PFC is a qualitative assessment based on quantitative science. PFC is also an appropriate starting point for determining and prioritizing the type and location of quantitative inventory or monitoring necessary (USDI, 1998, 2003). The assessment is a checklist approach designed to be used by an interdisciplinary team on both lotic and lentic riparian areas. Lotic riparian areas are riverine systems such as creeks and lentic areas refer to any other areas that will maintain riparian wetland vegetation such as lakes or wetlands.

**Table 10 - Proper Functioning Condition of select riparian-wetland areas with the analysis allotments.**

Allotment	Location	Type of assessment	PFC rating
Lake Mountain	Kuntz Creek headwaters	Lotic	Proper Functioning Condition
Middle Tompkins	Townsend Meadow Creek	Lotic	Proper Functioning Condition
Middle Tompkins	Tyler Meadow-Fish Creek Headwaters	Lotic	Proper Functioning Condition
Middle Tompkins	Faulkstein Meadow	Lotic	Proper Functioning Condition/Nonfunctional

Aerial photos from 1944 to the present indicate the Kuntz Creek headwaters (especially the alder stands) have changed very little over the past 60 to 70 years. The stream channel was and is densely covered by alder and conifers which provide stability to the channel. The stream is a steep, confined V-notched valley with a gravel-dominated step pool system. Gullies and rills

were minimal but there are a few livestock/wildlife crossing areas and an area of localized trampling near the bottom of this stream reach. Riparian vegetation was well established and banks were stable.

The creek at Townsend Meadows has moderate sinuosity with a gentle gradient. The meadow appears to have expanded, especially on the northern edge due to extensive logging. Riparian vegetation was diverse and dense, but also included several introduced species. Average channel size was 1 foot wide and 4 inches deep, and filled with fine silt; width to depth ratio would need to be improved to meet potential. The willows surrounding the meadow complex looked as if they were recovering after a large disturbance or severe browsing. Reviewing the history of the area it is likely that heavy timber harvest disturbed the growth habitat, and the willows may have been “hedged” by wildlife and livestock until they grew above the browse line.

Aerial photos of Tyler Meadow demonstrate it has remained similar in appearance since 1944. The principal change has been conifer encroachment and increase in alder brush cover. The stream was narrow, deep, and densely covered by high to mid seral riparian vegetation. The riparian area appeared to have achieved potential width. There were several small elevation drops caused by erosion but nothing significant enough to make the creek vertically unstable.

Faulkstein Meadow is a narrow stringer at the headwaters of Fish Creek. Sharp contrast of forest to meadow vegetation across an unusually straight intermittent drainage channel on the meadow’s north side suggests skid road construction parallel to the stream altered this meadow hydrologically during the 70’s and 80’s. Current vegetation on the upper portion of the reach is highly productive and in relatively good condition despite proximity to FS road 45N38 and to the Faulkstein seasonal hunting camp. On the lower portion of this reach there is a deep headcut and an incised channel that has stabilization structures in creek. The headcut was likely a result from the previously mentioned logging practices. Flood plain development is not present on the lower part of the reach. One of the wooden structures was charred during the fire but remains; it will be viable for a short time. Falling logs should function as a replacement. The upper part of the reach was proper functioning condition however the lower portion was nonfunctioning. A small enclosure is proposed to protect the headcut from potential cattle impacts.

## **Implementation Monitoring**

Implementation monitoring includes range readiness and utilization. Annual monitoring occurs on the Lake Mountain and Middle Tompkins allotments for range readiness and utilization.

### *Utilization*

Utilization monitoring has been an important tool for range management. It is generally considered to be the percentage of current vegetative forage removed by grazing animals, or the amount of residual vegetation left after grazing. Photo monitoring is employed to qualitatively monitor some vegetation characteristics. Percent utilization for Lake Mountain and Middle Tompkins allotments has been collected with the comparative yield and landscape appearance methods. Percent utilization can be determined with Comparative yield if cages are placed in key areas at the beginning of the season, with forage inside measured during the fall to estimate annual forage production. Measurements are then taken outside the enclosure to determine an average amount of forage (generally expressed in pounds/acre) remaining after grazing. Amount

of forage in the ungrazed plots minus amount remaining in the grazed plot, divided by the amount of forage produced, times 100, equals the total percent utilized. Percent Utilization =  $[(\text{Ungrazed} - \text{Grazed}) / \text{Ungrazed}] \times 100$ . Percent Utilization will also be assessed through use of a “landscape appearance” technique. Protocols for Comparative Yield and Landscape Appearance can be found in the Utilization Studies and Residual Measurements Technical Reference (USDI. 1999).

For rangeland management on the Lake Mountain and Middle Tompkins allotments, percentage utilization has been the main standard and has been recorded since 1996, though not all years are represented. Woody Utilization of riparian shrubs has also been recorded periodically through landscape appearance or ocular measures. These standards are intended to safeguard riparian resources from damage by excessive livestock grazing. Clary and Leininger (2000) also note that stubble height is a short-term management guide for long-term riparian resource objectives and that the stubble height standards themselves should not be thought of as a long-term resource objective. A stubble height of 4 to 6 inches has been widely recommended and enforced as a general grazing standard on public lands for the last decade (USDA. 1991; USDA. 1992; USDA-FS, 1995). In some circumstances, a 3-to-5-inch stubble height has been recommended, depending on stream type and season of grazing (Clary and Leininger. 2000; Hall and Bryant. 1995; USDA. 1991; Stubble Height Review Team, 2006).

Table 11 illustrates existing guidelines from the KNF LRMP (S&G 23-15) for utilization of key species by ecological condition and vegetation community type (USDA-FS, 1995).

**Table 11 - Percent allowable utilization levels by Ecological Condition**

Ecological Condition	Upland	Wet Meadow	Riparian
Satisfactory	40-55%	45-60%* 3 to 4 inches**	40-50%* 3 to 4 inches**
Unsatisfactory	25-35%	25-40% 4 to 5 inches	20-30% 4 to 5 inches
Utilization levels of woody vegetation	45-55%	45-55%	35-50%
* This figure represents the percentage of the current year's growth that is acceptable to be removed during single grazing year (utilization level).			
** This represents the approximate height of vegetation that will remain on the site after the end of the grazing season. This figure is an estimate, based on a general knowledge of the herbaceous species that occupy these types of sites within the Klamath Province. These figures must be refined based on species composition and growing conditions.			

Current monitoring information for Lake Mountain includes data from 1998-2013. Not all years are represented. Non-use was taken on this allotment from 1998 to 2000, during 2002, and from 2010 to 2011. Percent forage utilization at the Kuntz Creek key area has an average of 41% which meets utilization standards for dry meadows in satisfactory condition. Utilization exceeded standards during 2013. Utilization at Lookout Spring has been recorded from 2009 to 2013 and exceeded utilization standards during 2009. Average utilization for 2009, 2012, and 2013 at Lookout Spring is 60%, the upper limit of KNF utilization standards. Woody utilization in Kuntz Creek was recorded during 2012 and 2013 with little to no utilization observed.

The most complete current percent forage utilization data for Middle Tompkins exists for Middle Creek Meadows key area, where utilization was recorded from 1996 to 2006. The allotment was in non-use from 2007 to 2009 and remained vacant from 2010 to present. Percent forage utilization was at or below utilization standards from 1996 to 1999 and in 2006. Utilization

exceeded standards during grazing seasons from 2000 to 2005. Average percent utilization for from 1996 to 2006 was at 70%, exceeding the 60% allowable utilization standard.

Utilization in the Eagle Springs grazing subunit was recorded from 1998 to 2002, though not all years were recorded. During 2002, utilization exceeded standards. Utilization averaged 57%. Non-use was taken in this subunit from 2003 to 2006.

Tyler Meadow was monitored for grazing utilization from 2000-2006. Utilization was at or below standards from 2000 to 2001, and during 2006. Utilization exceeded standards during the 2002 to 2005 grazing seasons. The average percent utilization from 2000 through 2006 was 66%, exceeding the 60% allowable utilization standard.

The Tompkins Creek riparian area was monitored from 1998 through 2006 in response to the NMFS May Affect, Likely to Adversely Affect designation (discussed above). No utilization was observed at this location.

### Use Levels

Livestock use levels are a method of identifying use patterns and to help interpret range trend data using utilization monitoring data. Utilization is the proportion or degree of current year's forage production that is consumed by animals (including insects) (USDI, 1999). Table 3 illustrates acres by use levels for individual allotments.

**Table 12 - NFS acres by allotment and use level.**

Use Level	Lake Mountain	Lake Mountain Proposed Boundary	Middle Tompkins	Middle Tompkins Proposed Boundary
Low Use <sup>1/</sup>	2,153	1,303	2848	3679
Moderate Use <sup>2/</sup>	175	175	55	121
High Use <sup>3/</sup>	12	12	17	30
Not Used <sup>4/</sup>	7,250	3,840	11,880	12,960
<sup>1/</sup> Low Use is less than 30% utilization; seed stocks remain intact and young plants undamaged. <sup>2/</sup> Moderate Use is 30 to 50%; 25-70% of seed stocks remain intact and most young plants undamaged. <sup>3/</sup> High Use is greater than 50% for any given year; more than half of the available forage has been utilized. <sup>4/</sup> Not Used may have incidental livestock use but is generally not used at all by livestock.				

To put use levels in perspective, tables 13 and 14 shows the percentage of allotment area within each use level as well as the percentage of riparian reserves at each use level for the current allotment area (analysis area) and proposed allotment area (proposed analysis area).

**Table 13 - Use level by percentage of current allotment area (analysis area).**

Use Level *	Approximate % of Allotment Area	Approximate % of Riparian Reserves
Low Use (5-30%)	21	21
Moderate Use (30-50%)	1	1
High Use (50%+)	0.1	0.0
Not Used (0-5%)	78	78

**Table 14 - Use Level by percentage of proposed allotment area (proposed analysis area).**

Use Level *	Approximate % of Allotment Areas	Approximate % of Riparian Reserves
Low Use (5-30%)	23	21
Moderate Use (30-50%)	1	2
High Use (50%+)	0.2	0.1
Not Used (0-5%)	76	77
* The terms low use, moderate use, high use and not used describe the estimated proportion of annual herbage removed by grazing.		

High use areas are mapped as they are identified over time; but some unmapped high use areas may occur. For example, an area receiving high use during one year may receive only moderate use the following year, and vice versa. As illustrated in the above table, high use levels on NFS lands generally occur on 0.2% or less of the analysis area, representing a very small portion of the analysis allotments. Moderate use also occurs on a small proportion of the analysis area. Approximately 21-23% of the analysis allotment acres are at low use levels and 76-78% of the acres are not used. Thus, 98% or more of the allotment analysis acres are intact or lightly used by cattle.

Most of the Lake Mountain Allotment receives low or no use. High use grazing areas occur near springs in the Kuntz Creek complex and moderate use areas are mapped in wet and dry meadows in portions of section 14, 15, 16, and 17 near the Kuntz Creek and Mack's Creek headwaters (Appendix B).

There are two high use areas in the Middle Tompkins Allotment: Middle Creek Meadows in section 8 and Tyler Meadow in section 36. Several moderate use areas occur in meadows and near ponds in the headwaters of McCarthy Creek, Middle Creek, Rancheria Creek, Tompkins Creek, Townsend Creek, and Faulkstein Camp areas (Appendix B).

### **Summary of Affected Environment**

About 24% of the allotment is capable of supporting grazing activities. Plots installed in 2012 and 2013 using the Rooted Frequency monitoring method showed a moderate to high vegetation condition and a satisfactory ecological condition (Table 9). BMP monitoring found that >10% of the Lookout springs area was impacted by hoof prints, but the vegetation was maintaining a moderate condition despite the disturbance. The BMP monitoring also concluded that the beneficial uses were not being affected in Kuntz Creek. Although the utilization standard was exceeded for several years on Middle Tompkins Allotment, moderate and high condition ratings in the Rooted Frequency Monitoring and the properly functioning condition of the Riparian Reserves (table 10) suggest rangeland condition has not been negatively impacted over the long-term. In the analysis area, the Happy Camp Complex Fire did not produce serious deep-rooted mortality of meadow vegetation to the point of negatively altering existing communities or their ability to recover quickly.

## **Environmental Consequences**

For a complete description of the project purpose and need and alternatives analyzed, please refer to the *Lake Mountain and Middle Tompkins Allotment Management Plan Project Environmental Assessment* (EA) for this project.

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action but occur later in time or are further removed in distance, but are still reasonably foreseeable. Cumulative effects are effects from past, present, and reasonably foreseeable future actions (federal, state, and private), combined with effects of the proposed activities. Numerous past actions, including timber harvesting and grazing, occurred in the allotments. Effects of past projects are incorporated into baseline data for this analysis.

### **Alternative 1 – No Action**

#### **Direct Effects and Indirect Effects**

Under Alternative 1 (No Action/No Grazing) no boundary changes would be made, livestock grazing would be discontinued on Federal lands in the Lake Mountain Allotment, and the Middle Tompkins Allotment would remain vacant.

Alternative 1 would not meet the purpose and need of providing sustainable livestock grazing opportunities on either allotment. There would be no forage use other than what occurs from native ungulates. Range improvements would not be constructed and existing structures would not be maintained. Overall, ecological condition will likely continue to be satisfactory and trend would be stable or increase on grazed riparian areas and rangelands depending on climate and soil type. However, implementation of Alternative 1 will not allow Tyler Meadow to move toward potential natural community. Dense unpalatable stands of mid seral creeping bentgrass will persist in Tyler Meadow, restricting growth of late seral species. Under Alternate 1, low quantities of available palatable forage will encourage continued selective grazing by elk of late seral Nebraska Sedge in Tyler Meadow. This may result in replacement by creeping bentgrass (Hurd and Pond. 1958; Arnold. 1964; Urness. 1981). If grazing is not resumed on Middle Tompkins Allotment, opportunities will be lost to use livestock as a management tool (Svejcar et al. 2014) to move Tyler Meadow toward potential natural community.

#### **Cumulative Effects**

Individual projects considered for cumulative effects are listed in Chapter 3 of the EA . The Frying Pan-Faulkstein Fire of 2014 and subsequently planned Westside Fire Recovery project in both allotments will release transitory rangeland and potentially increase the size of some meadows; however the extra forage would only be available for native ungulates as this alternative does not permit livestock grazing. Ecological condition and trend of rangelands will likely continue to be satisfactory with the ability to remain stable or increase depending on soil type and climate. Meadows and springs will be protected from compaction and ground disturbing activities through Westside Fire Recovery project design features. Heavy equipment use on the

Westside Fire Recovery project has the potential to spread weeds and affect rangeland condition; however project design features will be in place to adequately mitigate risks.

## ***Alternative 2 – Proposed Action***

### **Direct and Indirect Effects**

Under Alternative 2, the Allotment Management Plans for Lake Mountain and Middle Tompkins allotments would be updated and grazing would be authorized by term permits. The project includes redevelopment of Lookout Spring and an enclosure around the Faulkstein headcut. Alternative 2 alters the Lake Mountain Allotment boundary by removing 4697 acres (most of which produce no suitable forage) and proposes to increase Middle Tompkins Allotment by 2034 acres to adjust the allotment to a historically used boundary. See Chapter 2 of the EA for a full description of the proposed action and Adaptive Management Strategy.

Alternative 2 will meet the purpose and need of providing sustainable livestock grazing opportunities on the proposed analysis allotments and will facilitate meeting KNF standards and guidelines for condition and trend of rangeland resources. 76 HMs would be permitted on the Lake Mountain Allotment and 250 HMs would be permitted on the Middle Tompkins Allotment.

Long-term rangeland monitoring in the proposed analysis allotments suggests key areas are either meeting or moving toward desired conditions. Past forage utilization monitoring indicated that the Forest Plan forage utilization standard was not met on the Middle Creek Meadows key area from 2000-2005 and the Tyler Meadow key area from 2002-2005 on the Middle Tompkins Allotment. Based on recent frequency plot readings in Middle Creek (2012) and Tyler Meadow (2013), past high utilization did not result in unsatisfactory range conditions, PFC assessments, or BMPEP evaluations as detailed under Effectiveness Monitoring. Under Alternative 2 a stable or slow upward trend is expected to continue as Adaptive Management actions will be implemented if standards are not being met. Alternative 2 would allow grazing to be used as a tool to move Tyler Meadow toward potential natural community. Creeping bentgrass would be grazed which would allow late seral Nebraska Sedge to compete and potentially expand within the meadow.

High, moderate and low use levels would be similar to Table 12, 13, and 14. In addition, localized trampling and compaction would occur in moderate and high use areas. These effects are concentrated in small areas where cattle graze, congregate, and travel between foraging areas. High use levels on NFS lands generally occur on 0.2% or less of the analysis area and moderate use occurs on approximately 1% of the analysis area. Grazing management tools are also listed within the Adaptive Management Strategy to help distribute cattle and decrease concentration on the landscape.

Under Alternative 2, development of Lookout Spring will protect the vegetation around the spring from trampling and allow perennial sedges to rest and expand. Stock trough construction will provide a water source away from wet areas for livestock and wild ungulates. Installation of the stock-watering trough near the forest edge will increase soil compaction on upland areas at

the site and around the fence, but is expected to reduce trampling at the hillside-seeps below the wet meadow basin. The small pond at the spring may fill with sedges.

The headcut exclosure at Faulkstein meadows will protect the instable soils from possible livestock impact (trampling, slumping) so the headcut can move or heal naturally. There may be some compaction around the exclosure as cattle and wildlife move around the barrier. Other range improvements possible under Alternative 2 include repair of the Eagle Springs stock trough and installation of seep enclosures and stock troughs at the south fork of Tompkins Creek headwaters spring, at Yellow Jacket Spring, and at Rancheria Spring. Effects will be similar to that of Lookout spring.

### **Cumulative Effects**

The Frying Pan-Faulkstein Fire of 2014 and subsequently planned Westside Fire Recovery project in both allotments will release transitory rangeland and potentially increase the size of some meadows; expected use levels may decline at key areas as cattle will be distributed throughout the new transitory range. Ecological condition and trend of rangelands will likely continue to be satisfactory with the ability to remain stable or increase depending on soil type and climate. Meadows and springs will be protected from compaction and ground disturbing activities through Westside Fire Recovery project design features. Risk of weed invasion will also be mitigated through project design features although there will be a greater risk of spread with heavy equipment, firewood cutters, recreationist, and cattle moving through the allotment area. Number of HMs permitted would be unaffected as transitory range is temporary in nature and will not increase forage over the long term. Range improvements would be unaffected.

### ***Alternative 3- Current Management***

#### **Direct and Indirect Effects**

Alternative 3 would continue with the current management, leaving Middle Tompkins Allotment vacant and permitting 25 cow/calf pairs on Lake Mountain Allotment from 7/15 through 10/15. Allotment boundaries would remain unchanged, the improvements at Lookout Spring and Faulkstein meadows would not be constructed, and management actions would be limited to those allowed under the current permit.

Alternative 3 would partially meet the purpose and need of providing sustainable livestock grazing opportunities in the project area. Permitted HMs on the Lake Mountain Allotment would be 76; there would be no HMs permitted on the Middle Tompkins Allotment. Long-term rangeland monitoring demonstrates that key areas are meeting or moving toward desired conditions in the analysis area under current management. Under Alternative 3, a stable or slow upward trend is expected to continue in both allotments. Use levels would be similar to what is reported for Lake Mountain allotment in Table 12, 13, and 14, with high use occurring mostly in the Kuntz Creek basin. There would be no use in Middle Tompkins. There would be no new range improvements built. With no stock trough, concentrated use will continue at Lookout spring. The small sedge community at the spring is at risk of converting to annual pull-up muhly, which is shallow-rooted and has little forage value.

## Cumulative Effects

The cumulative effects identified for alternative 2 would apply to the Lake Mountain Allotment. The cumulative effects identified for alternative 1 would apply to the Middle Tompkins Allotment.

## Summary of Effects

To provide for ease of comparison, direct, indirect, and cumulative effects of Alternatives 1, 2 & 3 are summarized below in Table 15.

Table 15 - Summary of alternative actions.

Indicator	Alternative 1	Alternative 2	Alternative 3
Head Months (HM) <sup>1</sup>	0	326 (250 + 76)	76
Ecological condition	Satisfactory condition	Satisfactory condition	Satisfactory condition
Trend	stable/up	stable/up, with a potential upward trend in Tyler Meadow	Stable/up, with a potential downward trend at Lookout Spring.
Use Levels	None	Some areas of high and moderate use. Distribution tools available through Adaptive Management Strategy	Some areas of high and moderate use. Use is concentrated in Kuntz Creek Basin. No use in Middle Tompkins
Range Improvements Needed	None	Lookout Spring development and Faulkstein enclosure	No additional improvements

<sup>1</sup>HMs are the number of permitted livestock multiplied by the number of months (30 days) they are out on the grazing allotment. (e.g., 100 cow/calf pairs x 3 months = 300 HMs)

## Compliance with law, regulation, policy, and the LRMP

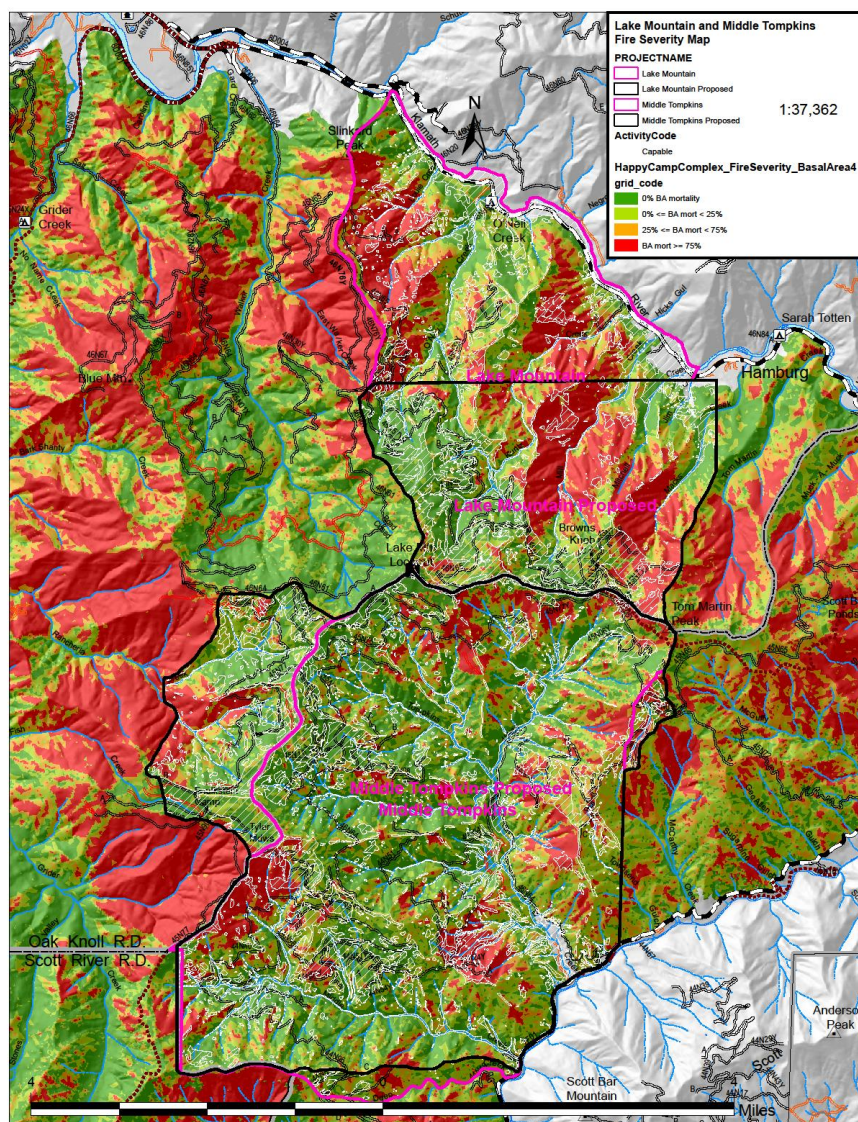
The Klamath National Forest operates under guidance of the Land and Resource Management Plan, KNF LRMP. The LRMP incorporates the Record of Decision for the Northwest Forest Plan (ROD). The LRMP and ROD established land allocations based on management emphasis with specific goals, desired future conditions, and standards and guidelines (S&Gs). The LRMP also provides Forest-wide goals, desired future conditions, and S&Gs. Current management under Alternative 3 has been determined consistent with the LRMP and, based upon monitoring, meets resource objectives. Forest Plan Standards and Guidelines as well as law, regulation, and policy that apply to the range resource will be met for each alternative by maintaining or enhancing ecological condition. All Alternatives meet or partially meet desired conditions for rangelands. Impacts from grazing are reduced to the extent possible with project design features.

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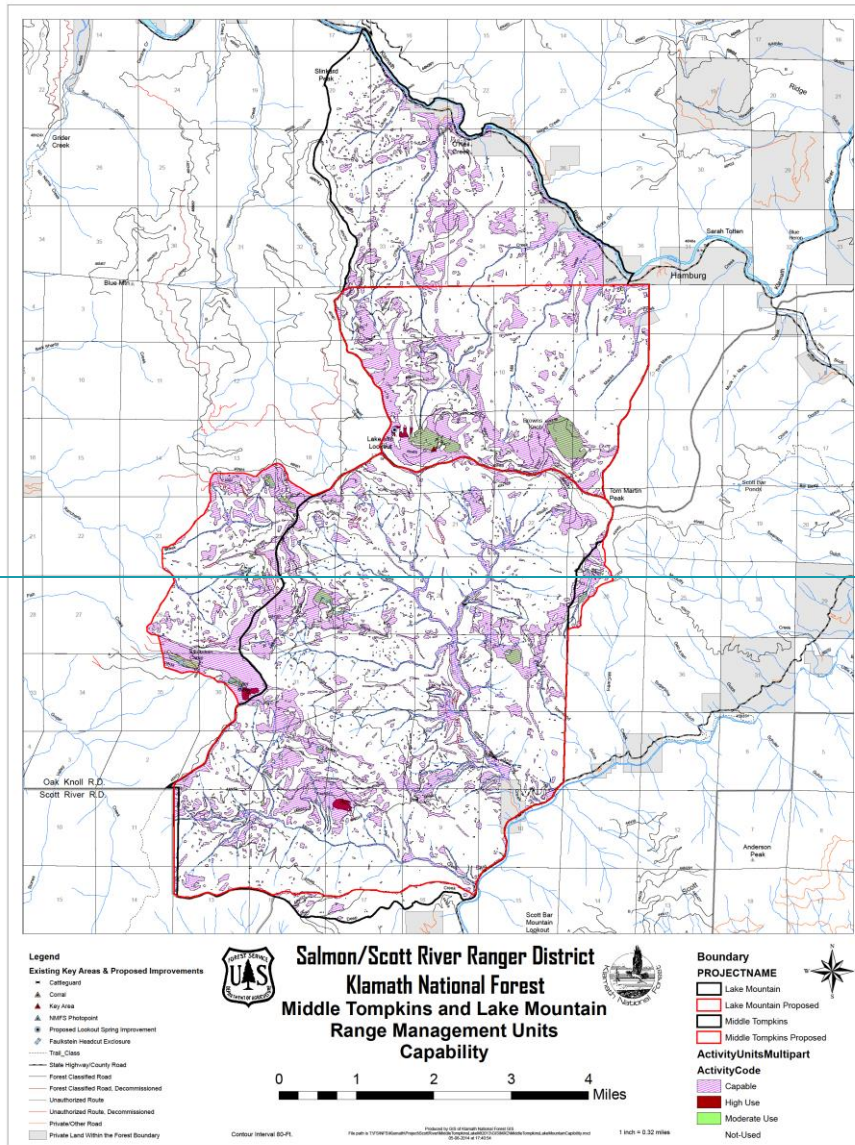
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**Appendix A - Frying Pan-Faulkstein Fire severity within the analysis area.**



**Appendix B - High and moderate use grazing within the analysis area.**



## Appendix C - Cost/Benefit Analysis

### Background

Klamath National Forest's Land and Resource Management Plan (Forest Plan) 23-5 requires "The following information and analysis...after completion of the Forest Plan:...Project documents, which are site-specific environmental analysis and decision-making documents pursuant to NEPA requirements, will be used...[to]...Conduct a cost-benefit analysis prior to construction of any range improvement."

The Lookout Spring enclosure is proposed to increase ecological status and range condition at the wet meadow and hillside seeps where current conditions include punching through soil by livestock accessing surface water. With existing perennial vegetation unprotected, low-value pull-up muhly (*Muhlenbergia filiformis*) may expand, driving down the meadow the seral status.

The wet-meadow can be stabilized with a small enclosure fence (1/4 acre) that is wildlife-friendly and constructed in a "take-down" style. A livestock trough will be placed on a nearby upland site and the overflow will be directed back into the meadow. As ecological status improves the fenced enclosure can be opened periodically to accommodate limited grazing.

The Faulkstein Meadow headcut enclosure is proposed to protect instable soil from livestock impacts so that the headcut can move or heal naturally. A small enclosure (1/10<sup>th</sup> of an acre) will be constructed in a zig-zag or split rail style around the headcut with 10" diameter logs found on site.

The two enclosures are "range improvements" requiring a cost-benefit analysis. Rather than a monetary cost-benefit analysis, a qualitative assessment of costs and benefits is appropriate. The National Environmental Policy Act Handbook (FSH 1909.15), Environmental Impact Statements and Related Documents (Chapter 20), Documentation of Cost-Benefit Analysis (23.32) notes that:

"If a cost-benefit analysis relevant to the choice among environmentally different alternatives is being considered for the proposed action, it shall be incorporated by reference or appended to the statement as an aid in evaluating the environmental consequences. To assess the adequacy of compliance with section 102(2) (B) of the Act, the statement shall, when a cost-benefit analysis is prepared, discuss the relationship between that analysis and any analyses of unquantified environmental impacts, values, and amenities. To comply with the Act, weighing of merits and drawbacks of the various alternatives do not need to be presented as a monetary cost-benefit analysis, and should not be when there are important qualitative considerations." (40 CFR 1502.23)

### Assessment of Costs and Benefits

#### Costs

The enclosure and trough at Lookout Spring will include materials and manual construction cost. Materials include springhead fittings, barbed and smooth wire [4-wire fence] including gate, wood corners and stretchers, steel t-posts, and a moveable trough fitted with a wildlife escape ladder served by PVC piping. Adjacent to the trough, less than 1/10 acre will undergo detrimental soil compaction. The enclosure will preclude most use of wet meadow forage by deer and elk

during periods when domestic livestock are excluded. Exclusion will initially result in a small forage loss to livestock and wildlife during the grazing season.

Faulkstein meadow headcut exclosure will include materials and manual construction cost. Materials may include lag bolts or spikes to stabilize the structure. Log material will be free but will need to be cut and bucked up at the site. The improvements will be built and maintained by both the Forest Service and Permittee.

#### *Benefits*

Exclusion of grazing at the spring will allow vegetation to rest and regain vigor and reduce the amount of trampling on hillside seeps. Over time, if wet meadow conditions improve, forage within the Lookout Spring exclosure will be made available to cattle near the end of grazing season when removal of above-ground growth would pose little threat to plant vigor. Trough construction would provide water for other uses including wildlife. Easy access to water at the trough will help to minimize potential impacts to riparian areas and further ensure compliance with the Aquatic Conservation Strategy.

Blocking access to the headcut at Faulkstein meadows will ensure that cattle do not exacerbate the headcut erosion. Building the exclosure is a preventative measure to help maintain stream function above the headcut.

